

Algebraic Concepts  
Lesson 25: Quadratic Functions  
Math for Standards

Name \_\_\_\_\_  
Date \_\_\_\_\_

*EQ: What are the characteristics of a quadratic function and how do you find the solutions of a quadratic function?*

A quadratic equation is an equation with a highest power of \_\_\_\_\_.

Standard form of a quadratic is when the equation is equal to \_\_\_\_\_.

We need to have a quadratic in \_\_\_\_\_ in order to solve the problem.

The easiest way to solve a quadratic is to \_\_\_\_\_ it, if possible.

Quadratics in the form  $y = ax^2 + bx + c$  can be \_\_\_\_\_. This graph is the U-shaped curve known as a \_\_\_\_\_.

Each parabola will either open \_\_\_\_\_ or \_\_\_\_\_. It will open up when  $a$  is \_\_\_\_\_ and down when  $a$  is \_\_\_\_\_.

Each parabola will have a \_\_\_\_\_ or \_\_\_\_\_. There will be a maximum when the parabola opens \_\_\_\_\_ and a minimum when it opens \_\_\_\_\_. The maximum or minimum occurs at the \_\_\_\_\_ of the parabola.

The \_\_\_\_\_ goes through the vertex. This axis is the line that you can fold the graph over on top of itself. Equation:

The \_\_\_\_\_ ( ) is the largest possible number/variable combination that can be “divided out” of each term.

Difference of two squares:

As a last resort, you can always solve a quadratic by using the quadratic formula:

Factoring a quadratic:  $x^2 - 9x + 18 = 0$

Steps:

Example 1: Solve and check.

a.  $m^2 - m = 30$

b.  $3x^2 - 18x = 21$

c.  $r(r + 5) = 15$

d.  $t^2 + 29t + 210 = 0$

Example 2: Determine whether the parabola opens up or down. Then find the equation for the axis of symmetry.

a.  $y = x^2 - 9$

b.  $y = -2x^2 - 4x + 3$

c.  $y = -3x^2 + 6x - 8$

d.  $y = x^2 - 6x$

Example 3: An object is dropped from a height of 1000 feet. The equation  $h = -16t^2 + 1000$  gives the height  $h$  of an object in freefall after  $t$  seconds. How much sooner will this object hit before an identical object dropped from 2000 feet?